

Presentation to the
June 14th 2021



The importance of transport: more than moving people and things

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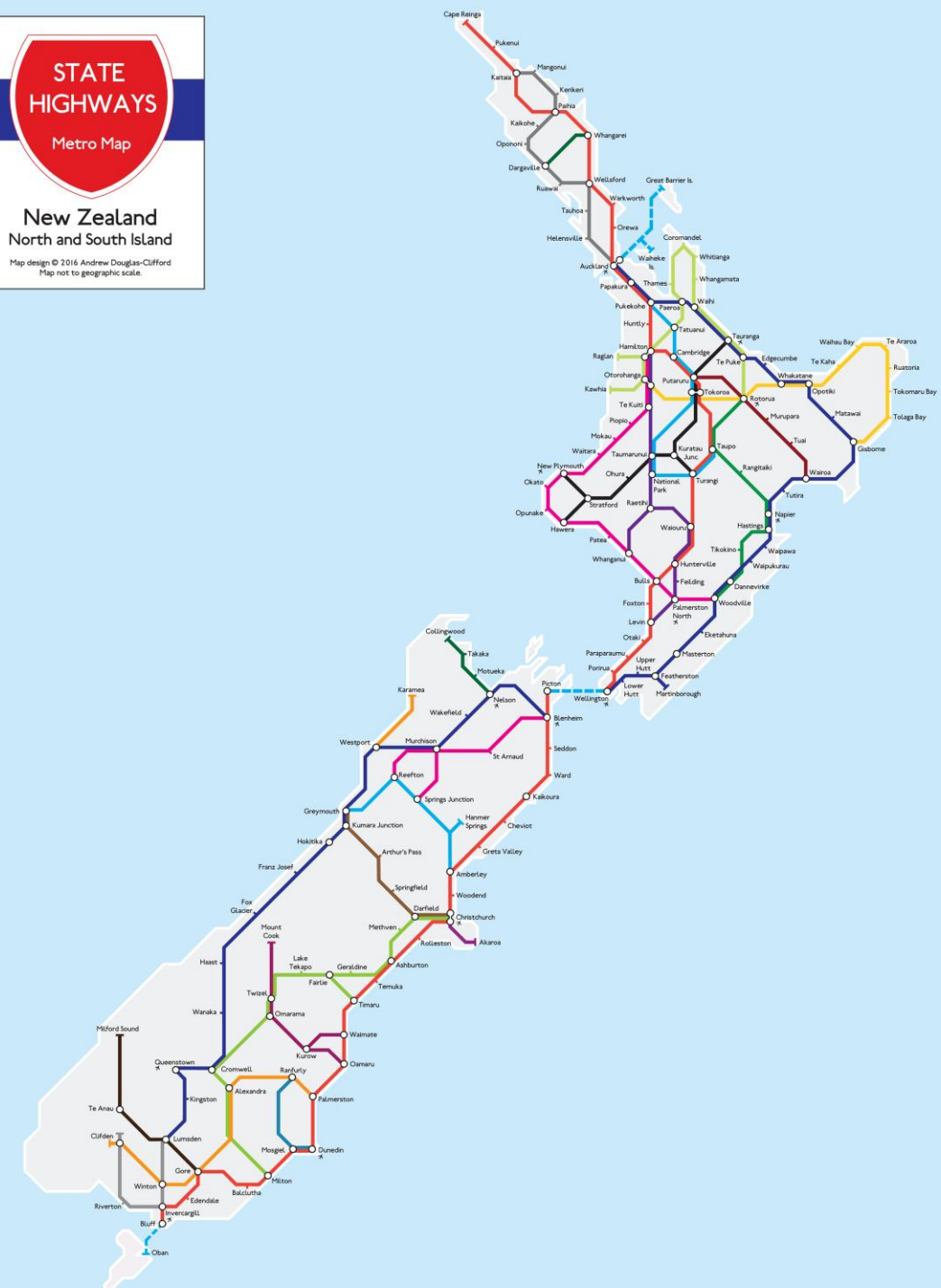
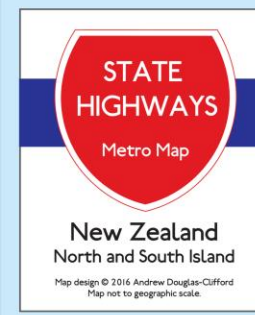
Ōtautahi | Christchurch

Why I'm here!

- Chief Science Advisor, Ministry of Transport, Wellington, NZ
 - 2 days a week
 - Secondment from UC
 - provide advice to the Ministry on areas that would benefit from scientific input
 - champions the Ministry's use of evidence throughout the policy process and its development of wider sector strategies.
- Professor of Geography, University of Canterbury, Christchurch, NZ
 - 3 days a week
 - Teaching and research

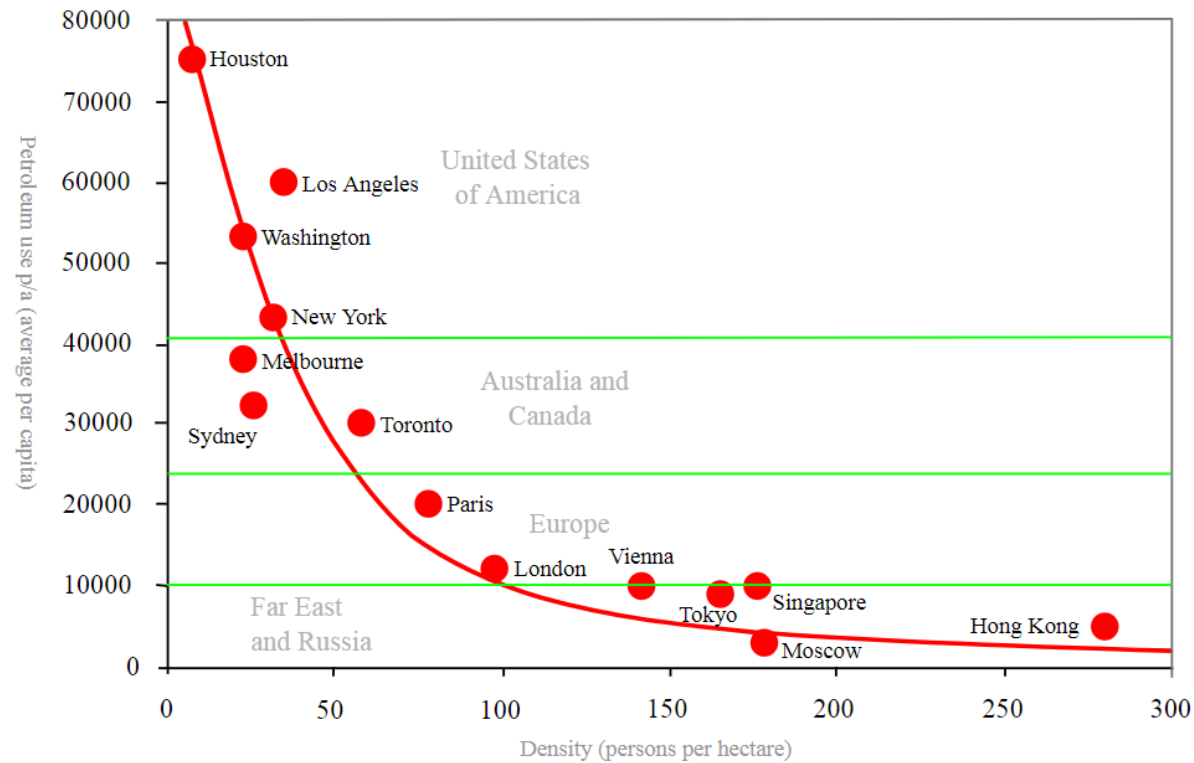
Movement and Access

- Movement
 - People and things
- Access to
 - Employment
 - Recreation
 - Social support
 - Health services
 - Raw materials
 - Products
 - Markets



Transport and land use

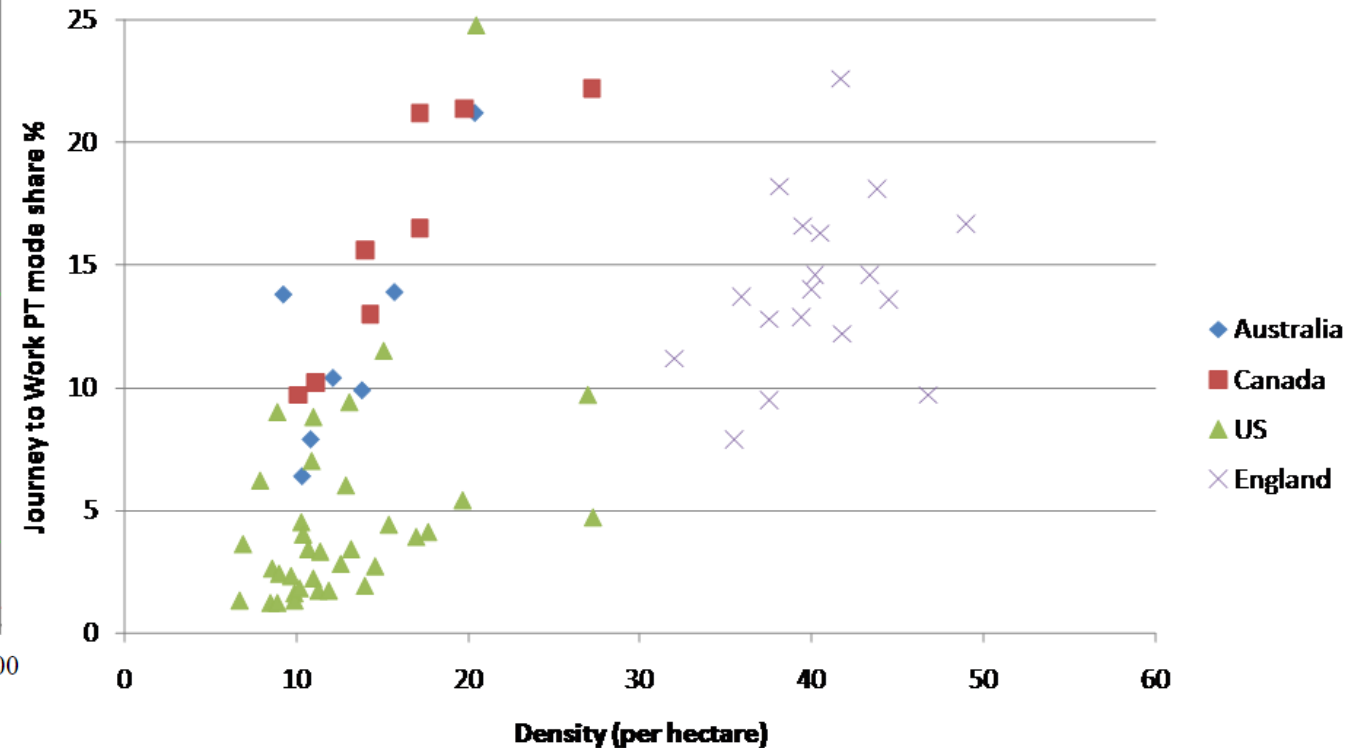
A commonly used study of 32 cities by Newman & Kenworthy in 1989 concluded that there was a strong link between urban development densities and petroleum consumption.



Annual petroleum use per capita adjusted to US MJ (1980)

After Andrew Wright Associates, small section taken from 'Towards an Urban Renaissance', Urban Task Force Partnership, 1999, © DETR, 1999

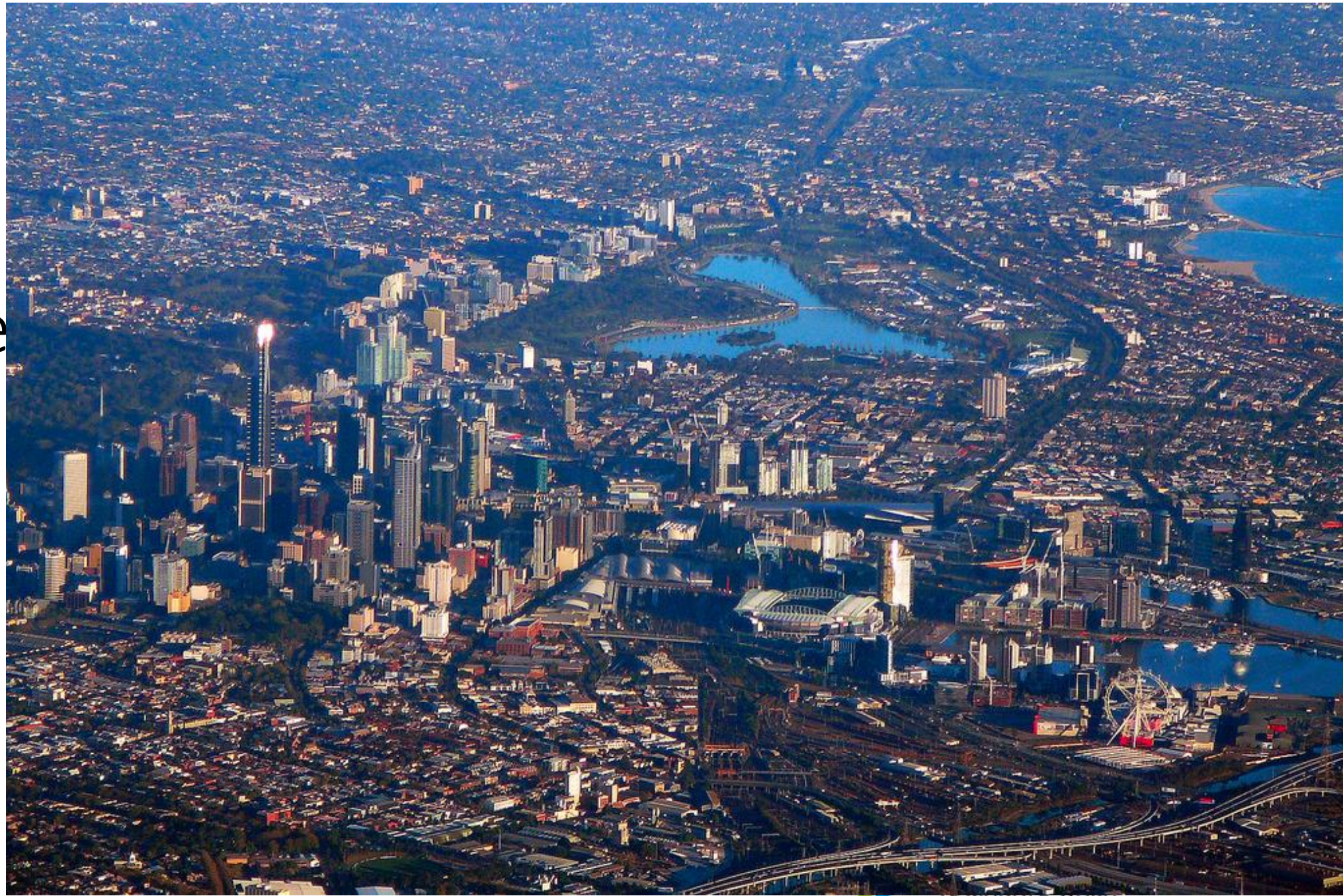
Urban density and public transport share of journey to work, 2000-2006



Source: Mees 2010, note density calculation methods not identical for all countries



Melbourne



Vancouver



The importance of time and speed

- Travel time savings are often/usually central to transport decision making
- Time/speed rules!

The importance of time and speed

- *The idea that the main benefit of improvements to transport infrastructure is the **saving of travel time has been central to transport economic analysis**. There is, however, **little empirical evidence to support this proposition**. Indeed, in the long run average travel time is conserved, implying that **travellers take the benefit of improvements in the form of additional access to more distant destinations made possible by higher speeds**.*
 - Metz D, 2008, The myth of travel time saving. Transport Reviews, 28, 3, 321–336.
 - www.greaterauckland.org.nz/wp-content/uploads/2009/10/Metz-2008.pdf

The importance of time and speed

17 May 2013 12:00 am | NZ Transport Agency

Motorists travelling the new Christchurch Southern Motorway Stage 1 are saving up to nine minutes in travel time in each direction - for a total time saving of up to 18 minutes a day.

The latest NZ Transport Agency journey surveys have found that motorists using the Christchurch Southern Motorway are **saving between four and nine minutes of travel time** between Hornby and Lyttelton, despite a 15% increase in traffic volumes on Brougham Street which has added between two to three minutes to travel times along this section of the route.

The NZTA's Canterbury/West Coast State Highway Manager Colin Knaggs says the new motorway, part of Christchurch's Roads of National Significance, is providing a faster and safer route between Brougham Street and Main South Road at all times of the day and in both directions.

"Commuters are saving up to 18 minutes a day in travel time, despite significant increases in traffic volumes on both the motorway and at the city end of Brougham Street, and they can expect even better travel time savings when the second stage of the Christchurch Southern Motorway is completed in 2018/19.

<https://www.nzta.govt.nz/media-releases/new-christchurch-southern-motorway-improves-travel-times/>

Tempers flare over port waiting times

Marta Steeman · 05:00, Apr 02 2013



DON SCOTT/ FAIRFAX NZ

LONG WAIT: Trucks line up at the Port of Lyttelton.

Tensions between truckies and the Lyttelton Port of Christchurch are escalating over long waits to pick up containers.

"There's talk of drivers wanting to do a blockade at the port. That's how bad it is," said a driver who wants to remain unnamed for fear of losing his job.

"We've been **waiting anywhere between two to three hours most days.**"

<http://www.stuff.co.nz/business/industries/8495726/Tempers-flare-over-port-waiting-times>

report

Good time/bad time



Whose time?



Congestion

- Do we need some congestion?
- *“the construction of a new road tends to result in a great increase in traffic, not only on the new road but also on the old one which it was built to supersede”*
 - 1930s, UK Minister of Transport
- *“better highways only generate more and more traffic until the city becomes a place largely for the movement and storage of cars.”*
 - 1960s US National Academy of Sciences
- *“new roads generate new traffic”*
 - SACTRA (1994) UK govt advisory committee report "Trunk Roads and the Generation of Traffic"

Congestion

- Latent demand released
- Congestion encourages people not to use cars, or not to travel at all (reduced mobility)
- *"In general it shall be assumed that projects do not induce any new trips or cause redistribution to new destinations."*
 - Transit New Zealand's Economic Evaluation Manual (2007)
- *"Some congestion is not bad"*
 - CEO, NZ Ministry of Transport 24/7/07
- *"Activities that reduce the cost of travel by reducing travel time or removing constraints can induce new trips or redistribute trips"*
 - NZ Transport Agency's Economic Evaluation Manual (2010)

Supply and demand

- Build and they will come
- Close it and they go away?

Supply and demand

Cheonggyecheon, Seoul, Korea



Supply and demand



Supply and demand

1970



2005



Supply and demand



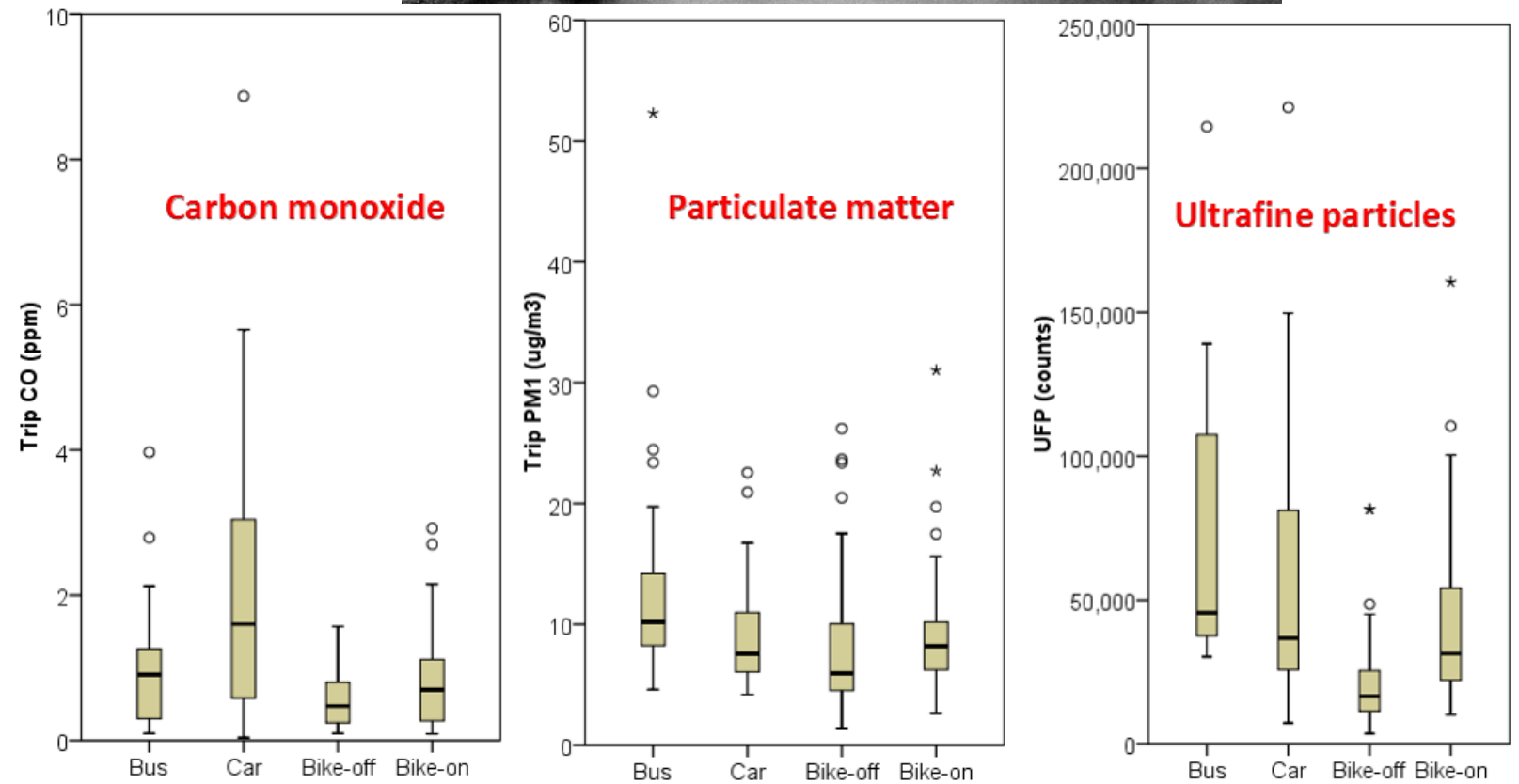
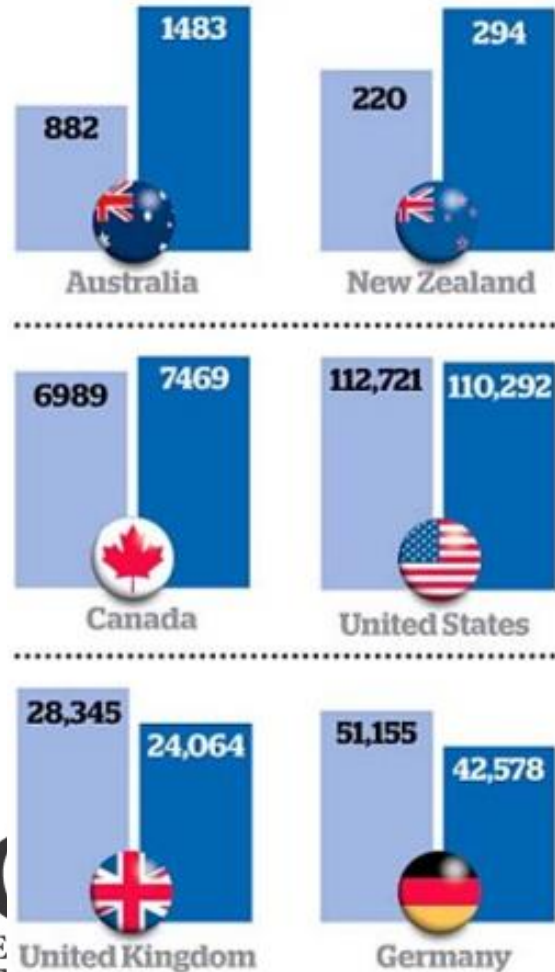
Where did the traffic go?

- *“It just disappeared”* - Prof Jeff Kenworthy

Traffic pollution

Deaths from air pollution in OECD countries

● 2005 ● 2010

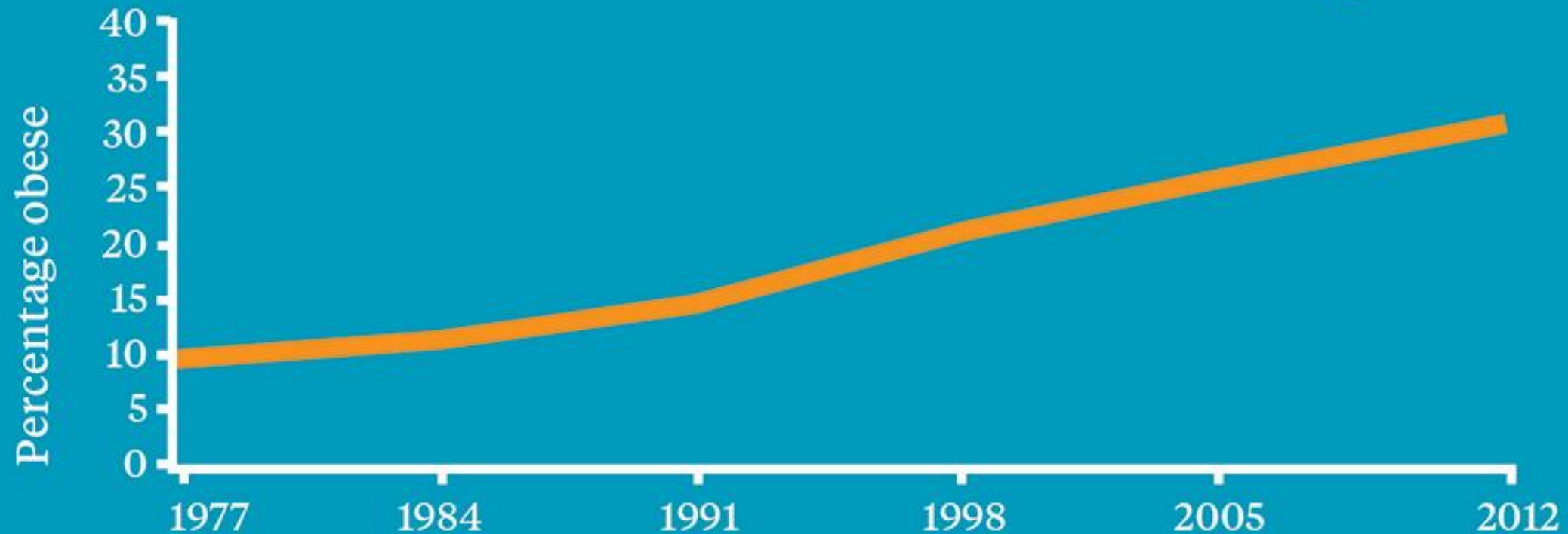


Source: Kingham et al, 2013, Variations in exposure to traffic pollution while travelling by different modes in a low density, less congested city. Environmental Pollution 181, 211-218.

Health and wellbeing

- Physical activity

New Zealand has the third highest adult obesity rate in the OECD and our rates are rising



Ministry of Health. 2015. *Understanding Excess Body Weight: New Zealand Health Survey*. Wellington: Ministry of Health.

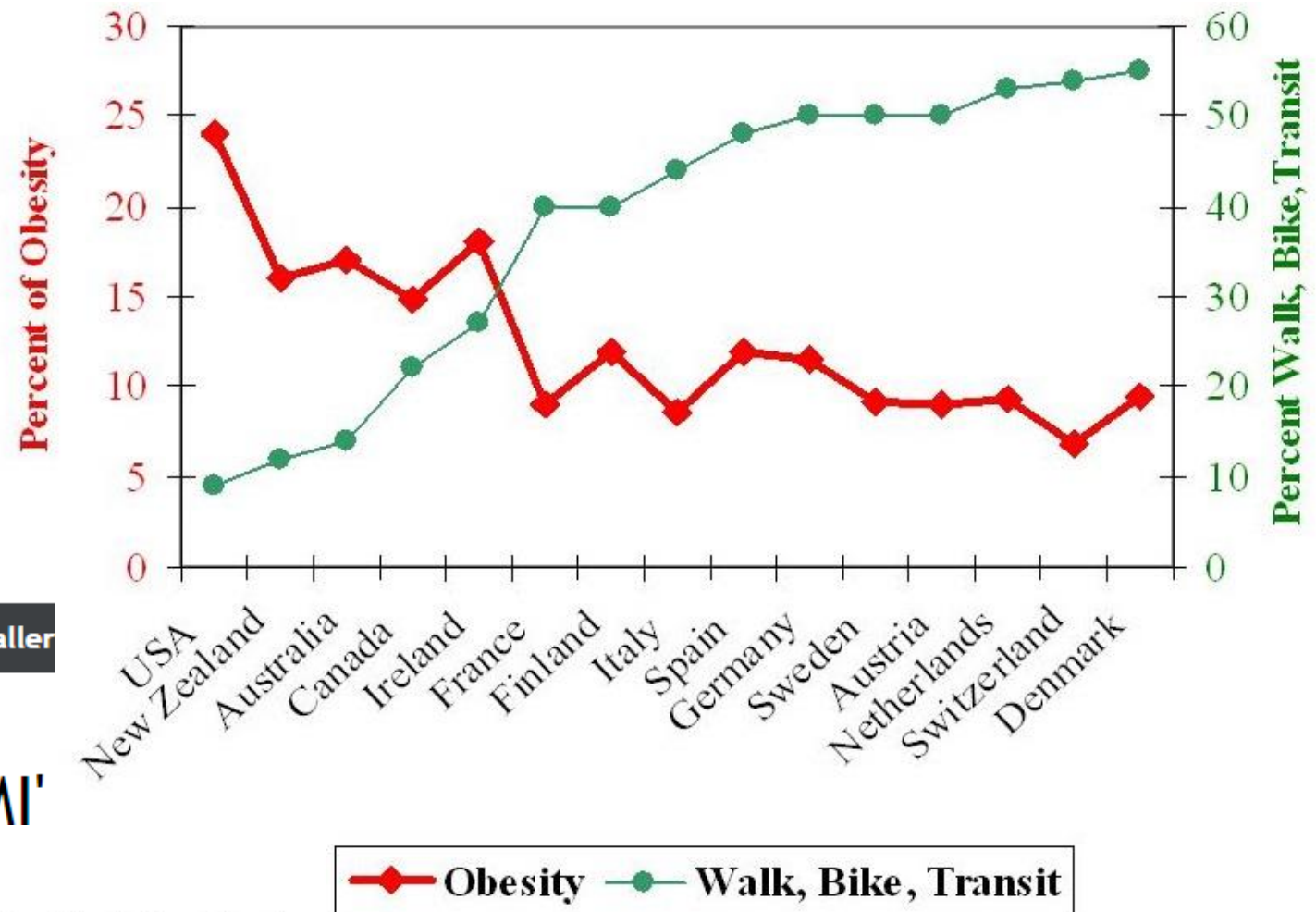
Obesity and active transport

Belfast
Telegraph.co.uk Friday 27 March 2015

News Sport DebateNI Business Opinion Entertainment Life Galler

Home UK

Active commuters 'have lower BMI'



Credit: John Pucher


Bassett et al, 2008, Walking, Cycling, and Obesity Rates in Europe, North America, and Australia. *Journal of Physical Activity & Health* 5 (6):795-814.

Public transport = active transport

- *"a transit trip involves 1250 steps, required to access and egress the network as well as to transfer between routes or modes [a round trip (2500 steps)] accounts for 25% of the recommended volume of physical activity per day" Canada*

Transport Policy 18 (2011) 800–806

Contents lists available at ScienceDirect

 **ELSEVIER**

Transport Policy

journal homepage: www.elsevier.com/locate/tranpol

Walking to transit: An unexpected source of physical activity

Catherine Morency^{b,c,*}, Martin Trépanier^{a,b,c}, Marie Demers^{b,d}

 **ELSEVIER**

Preventive Medicine

Volume 99, June 2017, Pages 264–268

Analyzing the impact of public transit usage on obesity

Zhaowei She^a, Douglas M. King^b  , Sheldon H. Jacobson^c

Journal of Transport & Health xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

 **ELSEVIER**

Journal of Transport & Health

journal homepage: www.elsevier.com/locate/jth

Walkability, transit, and body mass index: A panel approach

Michael J. Smart

Mental health

WELL-BEING AUGUST 13, 2010

PRINT

SHARE


Wellbeing Lower Among Workers With Long Commutes

by Steve Crabtree

Back pain, fatigue, worry all increase with time spent commuting



WASHINGTON, D.C. -- American workers with lengthy commutes are more likely to report a range of adverse physical and emotional conditions, leading to lower overall scores on the Gallup-Healthways Well-Being Index.

Mental health

 www.citylab.com/commute/2015/09/drivers-have-the-most-stressful-commutes/406429/

Drivers Have the Most Stressful Commutes

Transit riders and walkers, who avoid the “unexpected delays” of traffic, stack up better in a new survey.

ERIC JAFFE |  @e_jaffe | Sep 21, 2015 |  4 Comments

Transportation Research Part F 34 (2015) 141–151



ELSEVIER

Contents lists available at ScienceDirect

Transportation Research Part F

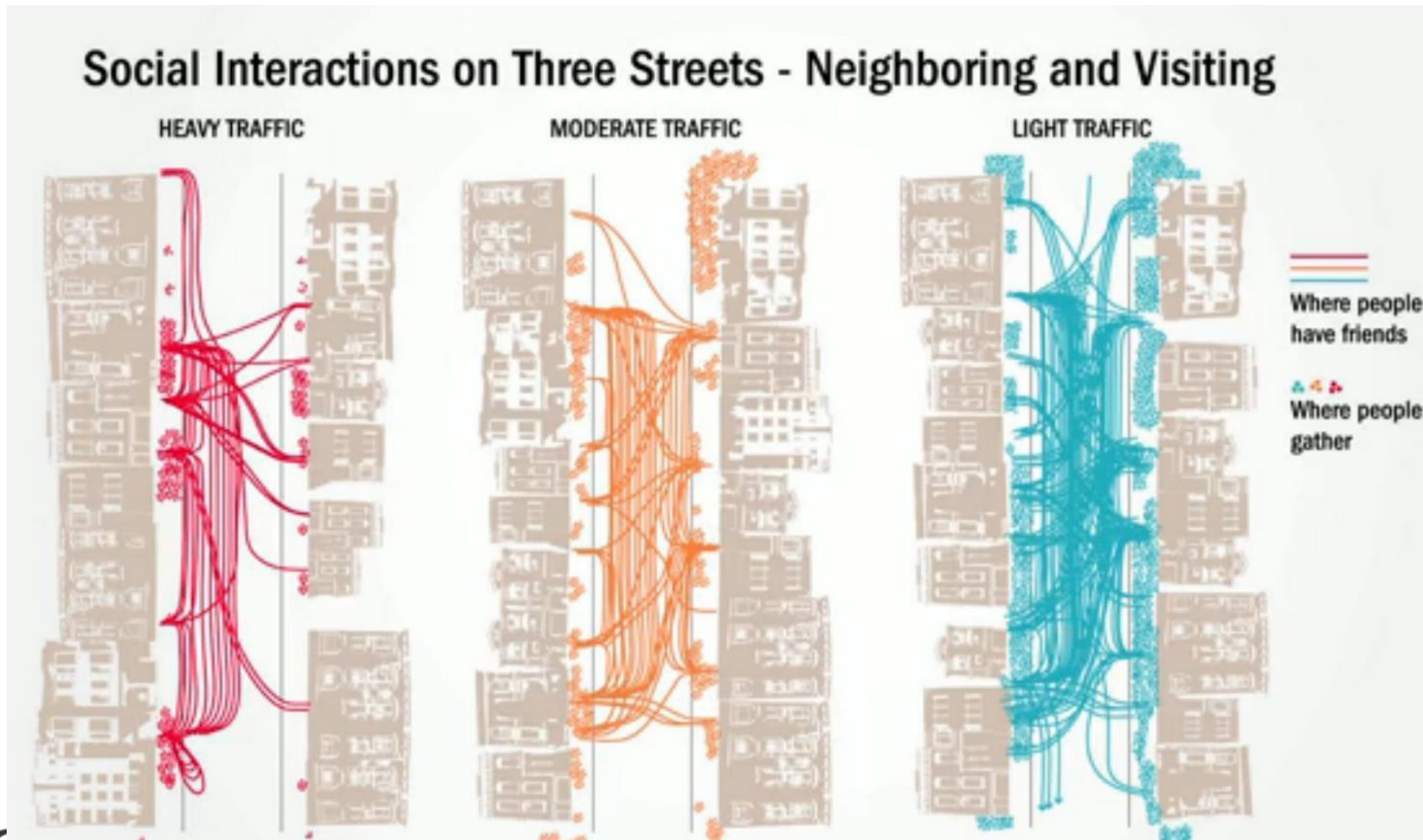
journal homepage: www.elsevier.com/locate/trf

Am stressed, must travel: The relationship between mode choice and commuting stress

Alexander Legrain^a, Naveen Eluru^b, Ahmed M. El-Geneidy^{a,*}

Journal of Transport
(A)

Traffic and community



Traffic levels: 16,000, 8,000
and 2,000 vehs per day

Figure 1: This image shows how community ties can actually be knit together by a street that is livable and inviting — or torn apart when auto traffic noise, pollution, and threats dominate the street environment.

Source: Figure 3, page 21, *Livable Streets*, Donald Appleyard, University of California Press, 1981.

Neighbourhood Connections

LIGHT (< 500 vpd)



5.1 average connections

"We have great neighbours and live in a safe street"
"I enjoy talking with my neighbours"

MODERATE (1400-2500 vpd)



5.9 average connections

"Most people get out and about and talk on the street"
"Family-orientated and friendly"

HEAVY (8,400-14,000 vpd)



2.1 average connections

"My street is a car thoroughfare"
"Lived here over 35 years, a decline in people talking to neighbours and children playing"

Wiki J, Kingham S and Banwell K, Re-working Appleyard in a low density environment: An exploration of the impacts of motorised traffic volume on street livability in Christchurch, New Zealand. World Transport Policy and Practice Volume 24, 1, 60-68.

Healthy environments

https://www.theguardian.com/society/2017/aug/25/the-obesity-crisis-a-healthy-population-needs-a-healthy-environment

Obesity

The obesity crisis: a healthy population needs a healthy environment

Public Health England is not up to the task, says **Rob Whewey**; we all need to stop eating for winter, says **Cian Foley**; gardening and tai chi can help older people stay fit, says **Louise Ansari**; what priority is the government giving to preserving urban open spaces for pleasant walks, asks **Mark Bryant**

f t e ...

126

Letters

Friday 25 August 2017
19.06 BST



Inner-city living makes for ... x +

https://www.theguardian.com/society/2017/oct/06/inner-city-living-makes-for-healthier-happier-people-study-finds

Housing

Inner-city living makes for healthier, happier people, study finds

Residents of higher-density areas are more active, more socially engaged – and less obese – than people who live in the sprawl of suburbia

f t e ...

5273 1,194

Reuters

Friday 6 October 2017
01.13 BST

A photograph showing a row of terraced houses in a city center. The houses are multi-story, built with brick and have white-painted window frames and doors. They are closely packed together, and the image is taken from a low angle, looking up at the buildings. The lighting suggests it's either early morning or late afternoon, with long shadows and warm tones. A street lamp is visible in the foreground.

Resilient Communities

- What can we learn about community from post-earthquake Christchurch
- Interviews with residents, leaders, stakeholders
 - Density, Socio-economic status, accessibility, environment, urban form
- Results
 - Geography
 - Local leaders
 - Housing stability
 - etc.

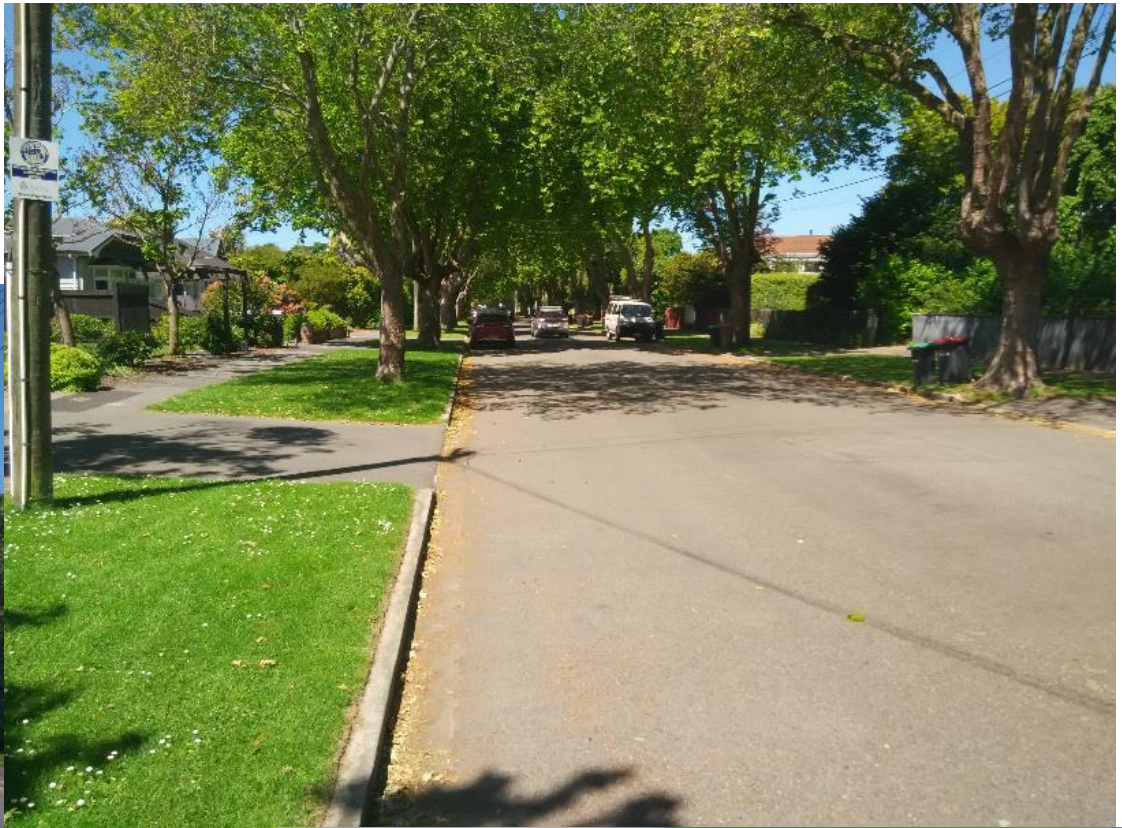


Karen Banwell

What we found: streets and travel

- Intimate streets – cul-de-sacs, laneways, back sections
 - *“Our street is wide so we don’t know each other”*
 - *“People get into their cars and go to work and then come home press the little button for their garage door and they go inside to their private spaces never once turning around”*
- Walkable – safe, attractive and connected
 - *“Because walking somewhere you see people and that is really important to us to see people and have that eye contact and being human together”*
 - *“It can take a long time to get to the shops unlike the places with fences and garages”*
- Green streets – presence of trees

Green streets



Proximity and urban design

- Local - community hubs, library, pools, parks, recreation areas
 - *“If you have to get in your car it’s not local”*
- Bumping places - schools, shops, street furniture
 - *“The school was the only bumping place for Phillipstown and then the Ministry closed it, the constancy in the children’s lives. The Ministry did not see the school as a community hub or the importance for the community”*
- Gathering places - churches, pubs, cafes
 - *“It’s hard for people to engage with each other when you don’t have a meeting place to come together”*

Bumping spaces



Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND



Vancouver

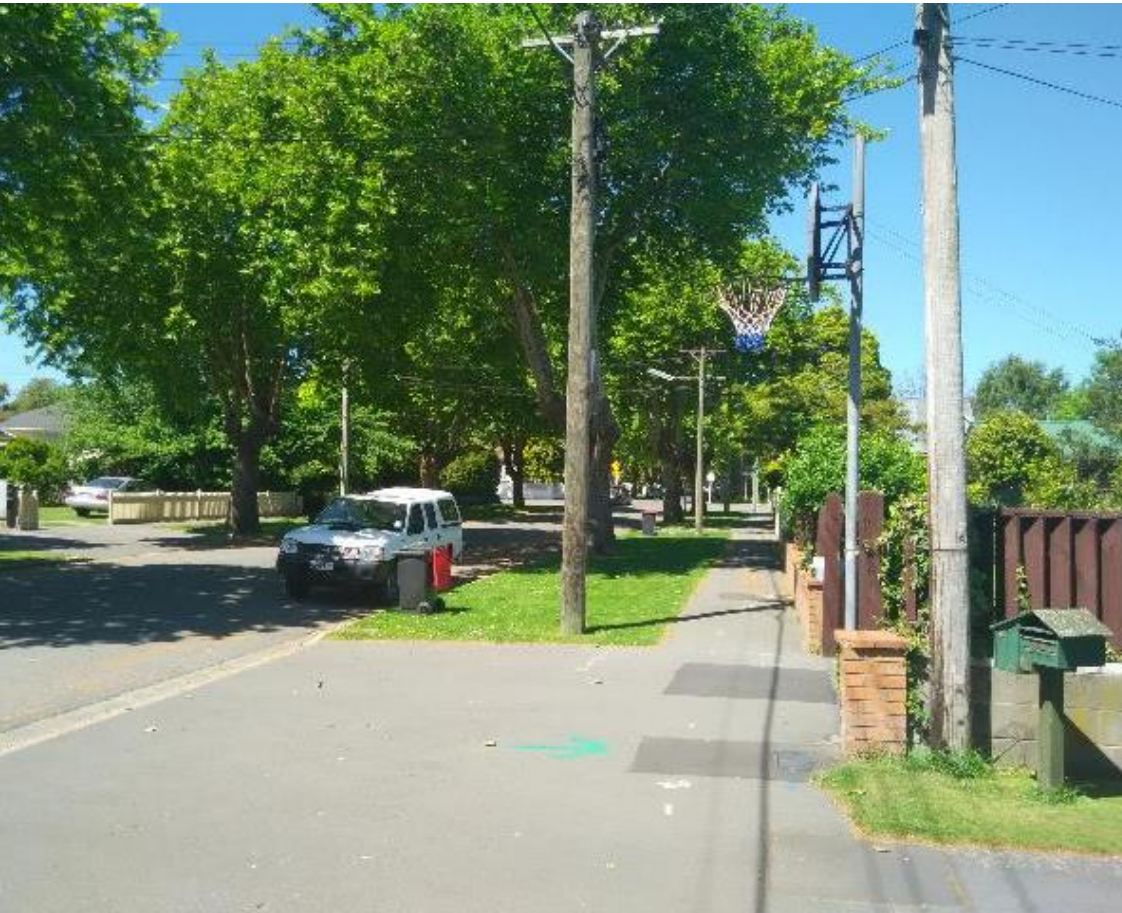
Bumping spaces



Christchurch (Alan Jamieson)

Bumping spaces / Play spaces

Christchurch



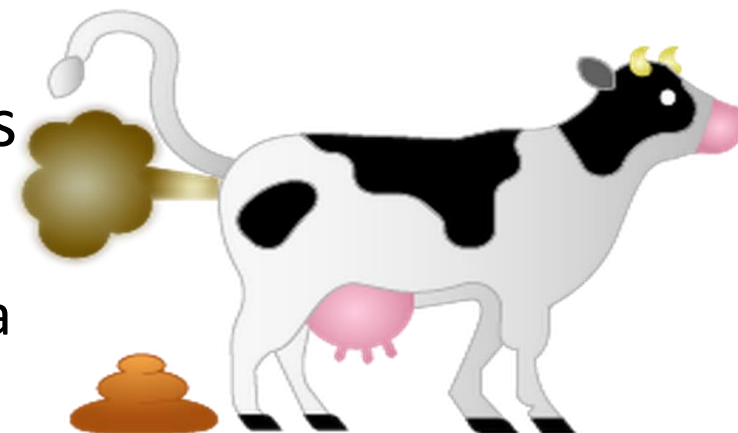
NZ Ministry of Transport – Outcomes Framework



and what about Climate Change?

In NZ

- Transport is responsible for 47 % of CO2 emissions
 - Per capita 4 x India and China
 - 19.7 % of greenhouse gas emissions (GHG) in Aotearoa



- Ministry of Transport's '*Hīkina te Kohupara – Kia mauri ora ai te iwi - Transport Emissions: Pathways to Net Zero by 2050*'
 - *Lifting of the toxic mist: And behold the breath of life.*
 - <https://www.transport.govt.nz/consultations/hikina-te-kohupara-discussion/>

How

Rod Carr, Chair Climate Change Commission, Jan 2021

- “the government must take **immediate and decisive action** if it wants to avert the worst ravages of climate change”
- “But the **government must move faster** – and support business, agriculture and **community** to do the same.”

How

Prime Minister Jacinda Ardern said the journey would be tough at times, but the numbers supported the country's plan to decarbonise.
"It's a safer, smarter and cheaper choice to act now."

- <https://www.stuff.co.nz/environment/climate-news/125383874/what-does-the-climate-change-commissions-roadmap-mean-for-our-lives>

Michael Wood, Minister of Transport

- *"There will be some **hard choices** to make, but it's obvious we can't continue with business as usual."*
- <https://www.beehive.govt.nz/release/govt-rev-reductions-transport-emissions>



Avoid-Shift-Improve Framework in Support Low Carbon Mobility

39%

61%

Avoid

Avoid and reduce the need for motorized travel

Shift

Shift to more environmentally friendly modes

Improve

Improve energy efficiency of transport modes



What needs to happen!

Key points

- *Multi-modal street layouts, lower speed limits, tactical street changes, ...traffic calming*
- *Quality compact, mixed-use urban development*
- *Compact urban form*
- *Frequent public transport services and rapid transit could support more compact urban form*
- *Safe and accessible walking and cycling networks*

Hīkina te Kohupara – Kia mauri ora ai te iwi, p 35

Key points

- *Shared mobility options such as car sharing and shared micromobility.*
- *Reallocate space on existing streets to deliver mode shift without building major new infrastructure*
- *Placemakingto create places that people want to live and work in, and that are good for people's wellbeing*
- *Transport demand management, including transport pricing*

Hīkina te Kohupara – Kia mauri ora ai te iwi, p 35

Changing streets

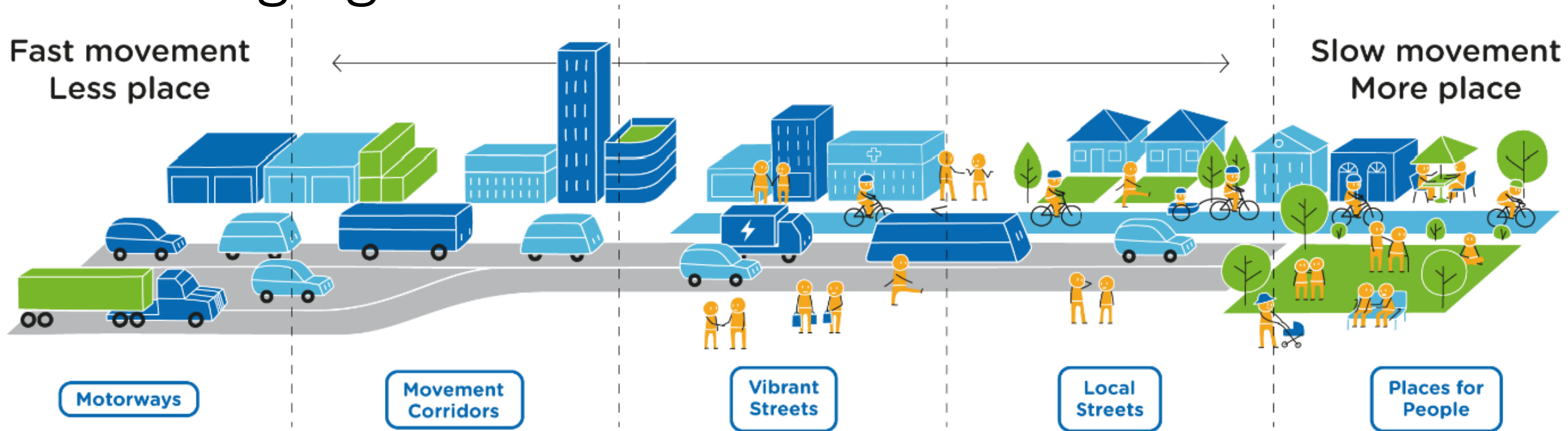


Figure 7. Movement and Place Framework

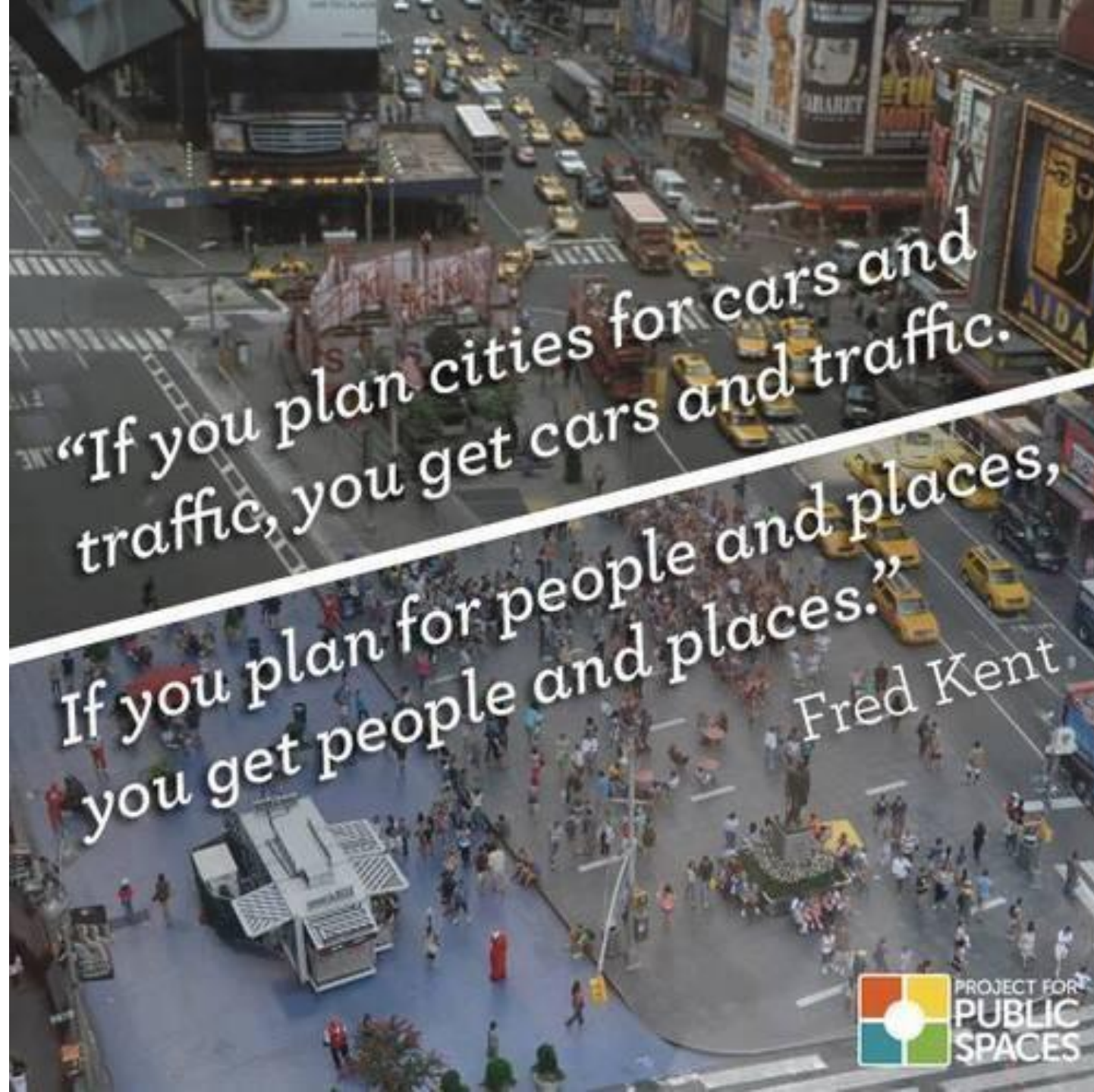
Changing streets

IMAGE BEFORE



IMAGE AFTER





“If you plan cities for cars and traffic, you get cars and traffic.”

If you plan for people and places, you get people and places.”

Fred Kent



PROJECT FOR
PUBLIC
SPACES

Ministry of **Transport**
TE MANATŪ WAKA

Canterbury

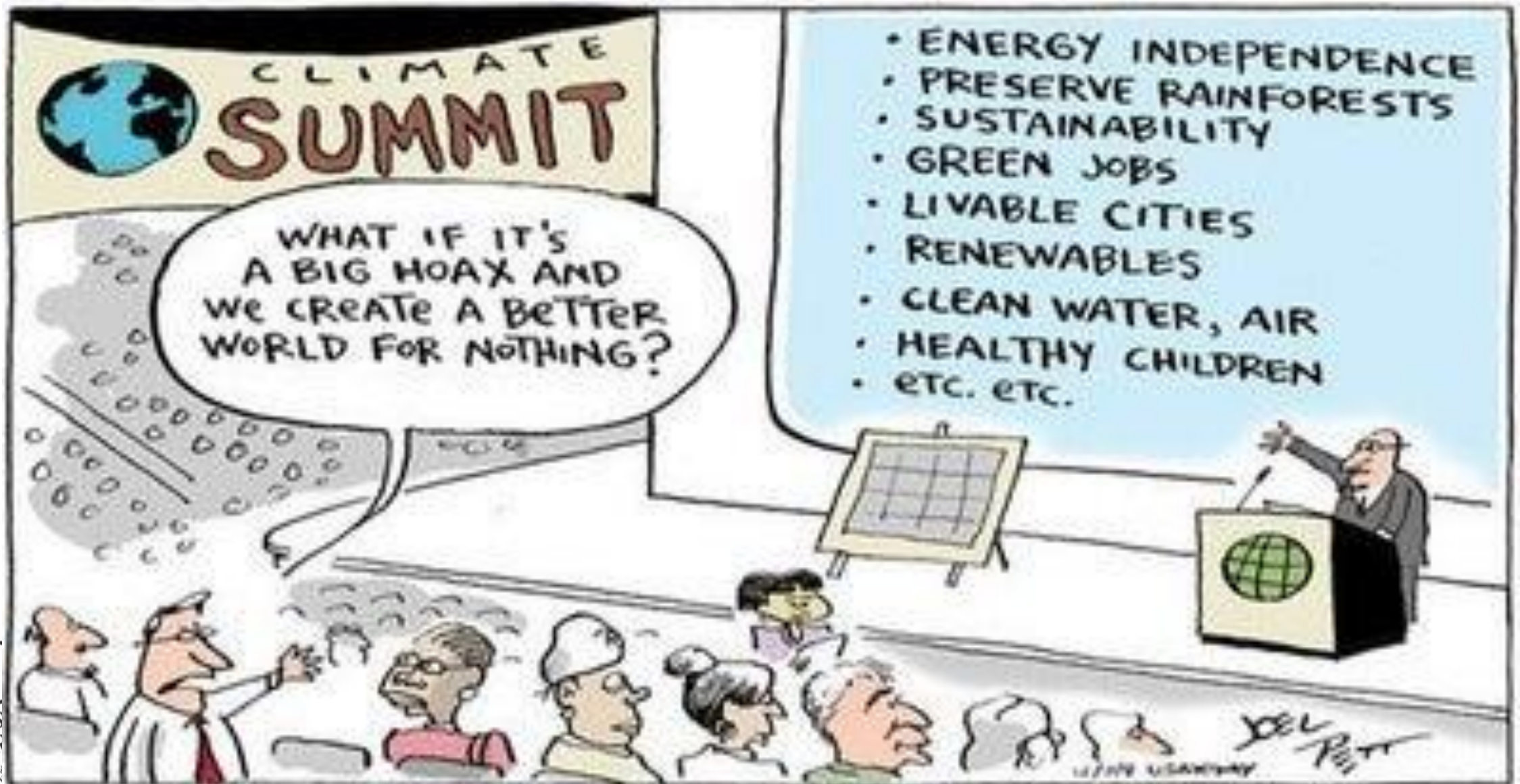
- *'It's time, Canterbury'* campaign launched on Friday
- www.itstimecanterbury.co.nz

**It's time,
Canterbury**

Our climate change
conversation

**Canterbury,
we are experiencing a
climate emergency.**

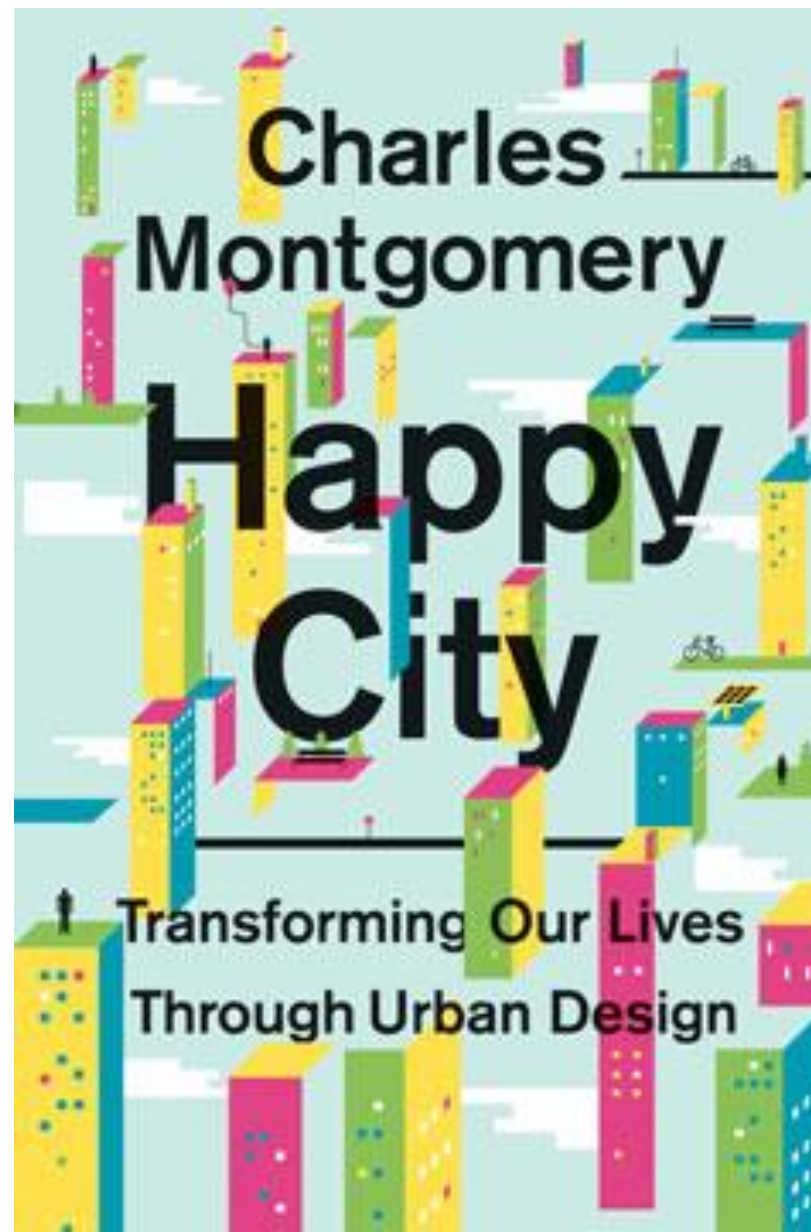
And what if climate change is a hoax!



Summary

- Transport is more than moving people and things
 - Drive and shape development
 - Health and wellbeing
 - Community
 - Climate change!

Thanks



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 **@SimonKingham**

Overall impacts

- On average, the estimated health benefits of cycling were substantially larger than the risks relative to car driving for individuals shifting their mode of transport
- - de Hartog et al, 2010, Do the health benefits of cycling outweigh the risks? EHP 118, 8, 1109-1116.
- The findings, which demonstrate a consistent dose–response for improved function and health, provide strong support for the promotion of cycling for public health
- - Oja et al, 2011, Health benefits of cycling: a systematic review. Sc Jnl of Med & Sci in Sports, 21: 496–509
- The health benefits of moving from cars to bikes heavily outweigh the costs of injury from road crashes
- - Lindsay G, Macmillan A & Woodward A, 2011, Moving urban trips from cars to bicycles: impact on health and emissions. Australian and New Zealand Journal of Public Health, 35: 54–60.